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Metropolitan Life Insurance Co.

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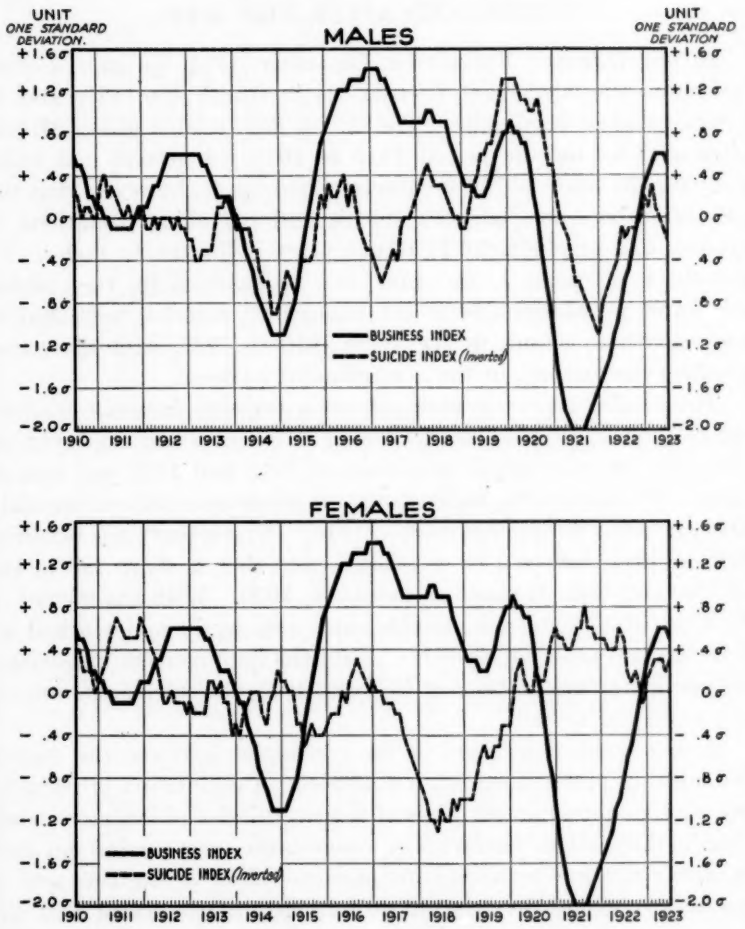
SUICIDE MORTALITY OF MALES AND FEMALES BEFORE, DURING AND AFTER THE WAR.

In the *Statistical Bulletin* for December, 1924, we gave a comparison of the concurrent fluctuations in suicide mortality and in general business conditions. The suicide data related to ten Middle Atlantic cities for the period 1910 to 1923. A second and fuller study for the State of Massachusetts alone shows, however, that the close correspondence between suicide and prevailing conditions of business and employment in recent years is limited to males. In the chart on page 2, we show the fluctuations in the suicide deathrates in Massachusetts for males and females, respectively, from month to month in the years 1910 to 1923, with the corresponding fluctuations in the conditions of business.

The suicide curve for males shows a response between January and December, 1914, to the slackening in business and employment. The recovery in business conditions in 1915 and 1916 was accompanied by a drop in the suicide deathrate for males. Below "normal" rates prevailed throughout most of 1916. A temporary rise occurred early in 1917, followed by a gradual, and then a sharp fall in the suicide rates until January or February, 1920. With the advent of the 1920-1921 depression, suicide rates rose again and reached an above-normal peak late in 1921. With the improvement of business and employment conditions in 1922 and 1923, the suicide rate among men again diminished.

As a numerical measure of the connection between the suicide rate and business conditions, a coefficient of correlation or covariation was computed on the basis of a general index of business conditions in the United States. The computation was carried out first for direct relation between simultaneous values of the two sets of variables. Second, by trial of various lags, it was found that the maximum correlation was exhibited for a lag of three months. The figures obtained for the coefficient of correlation were $-0.46 \pm .06$ without lag, and $-0.50 \pm .06$ with a lag of three months. In other

SUICIDES
and
BUSINESS CONDITIONS
in
MASSACHUSETTS
1910 *to* 1923



words, the effect of business changes is reflected at its maximum, three months after the event.

For females, on the other hand, there seemed to be no fixed tendency of the suicide rate to follow the line either for general business conditions or for suicide among males. Beginning with increased war stress in 1916, the suicide rate of females rose sharply during the early months of active participation in the war by the United States, and reached a peak in the summer of 1918. After the close of the war the suicide rate of females declined gradually, reached a low point during the profound business depression of 1920-1921, and remained below-normal throughout 1922-1923. During one of the most severe business and employment slumps in the history of the United States, the suicide deathrate of females in Massachusetts reached and maintained the lowest figures ever recorded for this group of the population.

It seems that marked differences between the suicide deathrates of males and females exist not only with respect to color, race or age characteristics, but also, as shown by the facts set forth above, with respect to the influence of the emotional stresses of war and of business and employment depressions.

Although the facts for females, as here presented, differ materially from those for males, in the manner indicated, this does not mean that the new results conflict in any way with the data for mixed sexes, as published in our December article, inasmuch as the mortality by suicide is much lighter among females than among males, so that the deathrate for both sexes combined reflects essentially the characteristics of that for males alone.

CHILDREN ARE THE CHIEF VICTIMS OF FATAL ACCIDENTS.

The menace of fatal accidents is concentrated very largely on the period of early childhood. Figures for the country at large show this clearly. Among Metropolitan Industrial policyholders during the year 1923 there were no less than 9,258 accidental deaths and nearly one-fourth of them occurred among children under ten years of age. This ratio is for all accidents. It would be even higher if we were to leave out of consideration the deaths from certain forms of accident to which children are not liable, namely those casualties which are due wholly or largely to the dangers of certain occupations.

The disclosures for certain forms of fatal accidents are of particular interest. For example, deaths from accidental burns, exclusive of those received in burning buildings, totaled 930 in 1923, and 57 per cent. of the decedents were under ten years of age, as compared with 7.6 per cent. between ages 60 and 70, the age period which

ranks next in importance to that of early childhood with respect to accidental burns. Burning buildings, as well, take a heavy toll of child life, 35.6 per cent. of all the deaths among Metropolitan policyholders in 1923 having been recorded among children under ten. Child life is also the most important age with respect to accidental poisonings, the record for the year studied showing that 39.4 per cent. of all the deaths were in this same age group. The nearest approach to this for any other period of life was 16.3 per cent. for persons aged 20 to 29 years. Other very important forms of accident which took a heavier toll in early childhood than at any other time of life were accidental drownings (21.4 per cent.) and automobile accidents (31.9 per cent.). In the case of accidental drowning the per cent. of the total deaths under age ten (21.4) was higher than for any other ten year period save 10-19 (39.0). Deaths by gunshot wounds were more important thus early in life than at any other time except in the two groups 10-19 and 20-29 years. With respect to street car accidents, only a single age group, between 30 and 40 years, showed a higher per centum of all the deaths than the period of early childhood. Relatively few children died from excessive cold, but child life suffered heavily from excessive heat, nearly one-fifth of the deaths in this insured group having occurred among those under ten years of age.

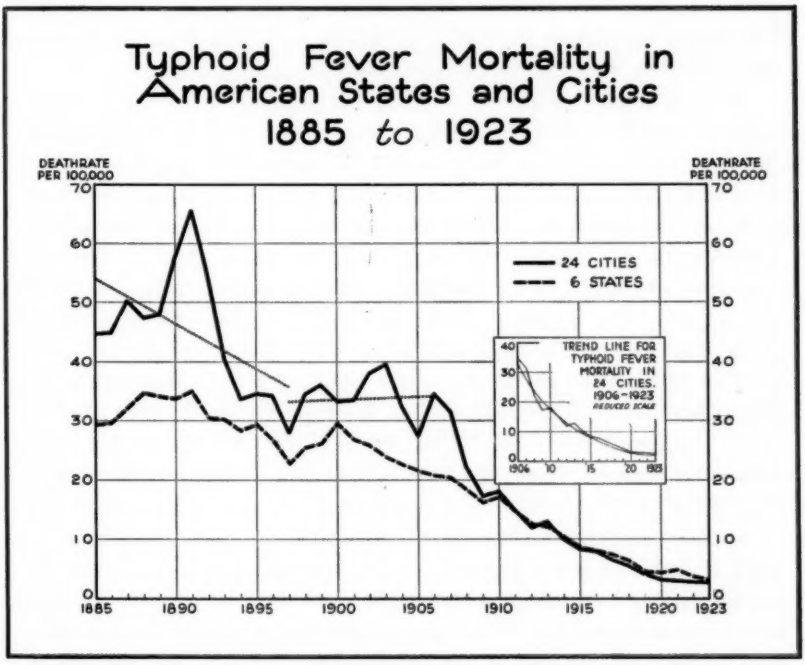
There are certain other forms of accidental death which, although not bulking large from the standpoint of numerical importance, nevertheless record a high ratio of their mortality among young children. Among these may be mentioned poisoning by food, with 45.7 per cent. of all deaths; poisoning by venomous animals, with 42.9 per cent.; accidental mechanical suffocation, with 50.8 per cent.; wounds by cutting or piercing instruments, 16.3 per cent.; and injuries by animals, 23.3 per cent., of the total mortality in this experience.

These comparisons show how important it is that more attention be paid to movements for the prevention of accidents in early life. The safety movement should direct its attention to the frightful accident death toll in this age range just as vigorously as it does to the control of occupational accidents. It has been computed that the loss in life expectancy from accidents is between one and one-half to one and three-quarters years for males, and about two-thirds of a year for females. The greatest loss takes place between ages one and two years or at the point where the effect on the expectancy of life is greatest.

THE CONQUEST OF TYPHOID FEVER.

Four decades ago, a group of twenty-four American cities* had typhoid fever deathrates which ranged from 40 to 60 deaths per 100,000 of population annually. In recent years the rate for these cities averaged around 3 per 100,000! In fact, in Fall River, Massachusetts and Hartford, Connecticut there were no typhoid fever deaths in the year 1924. Eighteen cities in 1924 had typhoid fever deathrates less than 2.0 per 100,000!

There were three distinct phases in the trend of the typhoid fever deathrate for cities during the past thirty years. The first phase is described by a drop in the rate from 65.6 per 100,000 in 1891 to 28 per 100,000 in 1897. There was an average fall of 1.5 per 100,000



per year between 1885 and 1897. These years marked the extensive sewering operations of American cities, the elimination of privies and of backyard wells and the wide extension of municipal water supplies to homes. From 1897 to 1906, there was apparently no progress in

*Boston, Providence, Chicago, New Orleans, Lowell, Philadelphia, Manhattan and Bronx Boroughs (N. Y. City), New Haven, Cincinnati, Newark, (N. J.), Milwaukee, Reading, Cleveland, Pittsburgh, Washington, (D. C.), Baltimore, Toledo, New Bedford, Springfield, (Mass.), Lawrence, (Mass.), Newton, (Mass.), Fall River, Scranton, Memphis. (The diphtheria, measles and scarlet fever data for this period were shown for eight of these cities in prior issues of this *Bulletin*. The data for whooping cough appear in the current number.)

typhoid fever control. For this second period the trend was practically horizontal (+.09 per 100,000 per year).

Between 1905 and 1910, however, there began another era which was characterized by the strict supervision, and later, by the filtration and disinfection of city water supplies. This soon had its effect upon the typhoid fever deathrate. In 1906, the rate for the combined populations of these twenty-four cities was 34.5 per 100,000 and thereafter the rate declined sharply until in 1923 the low figure of 2.7 was reached. The average fall per year since 1906 amounted to 1.8 per 100,000. The protection of water supplies during this most recent phase of the trend of the typhoid fever deathrate was supplemented by the pasteurization of milk, the supervision of the preparation of foods in public places and of food markets, supervision of the nurturing and shipment of shell-fish, and increasing use of anti-typhoid inoculation including millions of young men who saw army service in the late war.

For six States* which in 1885 had a population of nearly twelve millions, and in 1923 a population of more than twenty-three millions, the deathrate between 1885 and 1897 showed a gradual decline. Between 1897 and 1900, the rate rose, perhaps in response to the widespread prevalence of typhoid fever during and after the Spanish-American War. From 1900 onward, there was a steady downward fall of the typhoid fever deathrate. For every year between 1885 and about 1911, typhoid fever mortality of these six States was lower than the rate in the twenty-four cities. But, beginning about 1911 or 1912, the rate in the cities fell faster than the rate in the States, and for each year since 1915 the typhoid rate in the cities was lower than and fell faster than the rate for the six States. The somewhat slower rate of fall of typhoid fever mortality in the population of the six States may be accounted for by the greater difficulties of sanitary control among rural populations. The most effective work in typhoid fever control is accomplished when water supplies are filtered and disinfected and when milk and other food distribution is supervised. In 1923, the typhoid fever rate of the six States was 3.3 per 100,000 and of the twenty-four cities, 2.7 per 100,000.

At the present time, typhoid fever still shows high rates in the Southern States which have heavy proportions of rural and negro populations. In 1923, the State of Tennessee had a typhoid fever deathrate of 21 per 100,000, Georgia, a rate of 20.5 per 100,000, Kentucky, one of 19.3 and South Carolina, one of 17.9. Each of the States of Florida, Louisiana, Mississippi, Colorado and Virginia, have rates in excess of 10 per 100,000 of population.

*Massachusetts, Connecticut, Indiana, New Hampshire, New York and New Jersey.

Pending deep-seated changes in modes of rural life in these States, it seems that the largest results in typhoid fever control could be achieved by state-wide effort for anti-typhoid inoculation. The Southern States have been receiving more and more adequate health service in rural communities and while this has been accompanied by marked improvements in domestic sanitation of farm communities, and by the protection of the water supplies of cities and small towns in these States, there is still a considerable typhoid fever hazard to be combatted by means of the agency of protective inoculation.

The present note is part of a more complete survey of the typhoid fever problem now being made in this office and which we plan to publish within a few months.

WHOOPING COUGH MORTALITY IN TWENTY-THREE AMERICAN CITIES, 1885-1923.

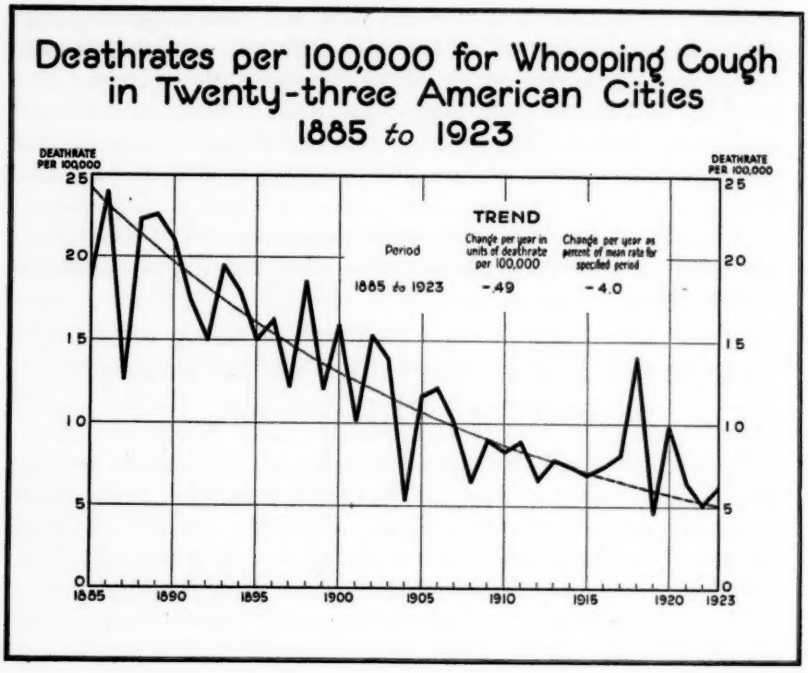
Between 1885 and 1923 the whooping cough deathrate in twenty-three American cities declined at the rate of 4 per cent. of the mean rate, per year. Measured in terms of the rate per 100,000 lives exposed in these cities, the fall was about one-half a point per year over this period. In the following table we show the comparative fall in the deathrates for diphtheria, scarlet fever, measles and whooping cough:

Decline in Mortality from Specified Communicable Diseases, 1885 to 1923, in a Group of American Cities.

Disease	Change per Year in Units of Deathrate per 100,000	Change per Year as Per Cent. of Mean Rate for 1885-1923
Diphtheria	—2.8	—5.1
Scarlet Fever	— .79	—5.1
Measles	— .43	—2.9
Whooping Cough:		
1885-1915	— .55	—4.1*
1885-1923	— .49	—4.0*
1915-1923	— .29	—3.8*

*Per cent. fall reckoned against mean deathrate for period specified in stub of table.

In the following graph we show the whooping cough mortality record, with the trend line for the period 1885 to 1923:



A preliminary study of the trend of the series of deathrates, by means of a four-year moving average, showed that the series followed a fairly consistent course from 1885 to 1915, but departed on the high side of its previous norm in the following years. A trend line was, therefore, fitted, based upon the record of the years 1885 to 1915, and this was then extended through the period 1916 to 1923. In these later years there was apparently a return to the marked inter-annual fluctuations in the deathrates which were recorded prior to 1908. It is possible that during this more recent period a somewhat different trend of mortality has set in. For the period 1915 to 1923, the average deathrate was 7.6 per 100,000, which was about .5 per 100,000 above the trend value for 1915. The tendency during this latest period was downward on this higher level, about .29 per 100,000, or 3.8 per cent., per year. The period is too short, however, to warrant any definite statement as to the tendency for the immediate future. The experience of a number of years after 1923 will have to be compiled before we can be certain of the underlying trend in recent years.

HEALTH RECORD FOR APRIL, 1925.

The month of April marked the continuation of the remarkably favorable health record that has prevailed during 1925 among the Industrial populations of the United States and Canada. This is shown by the extremely low deathrate of 10.1 per 1,000 prevailing among the more than sixteen million Industrial policyholders of the Metropolitan Life Insurance Company. The above figure is the lowest April deathrate ever recorded for this group with the single exception of that for April, 1922. It is lower by six per cent. than that for the corresponding month of 1924 (10.8) and shows a slight drop as compared with the preceding month of March.

Only one important disease, influenza, registered a considerably higher rate than for April a year ago. There were large declines for tuberculosis, heart disease, pneumonia and diarrheal complaints; and smaller ones for typhoid fever, cancer, diseases associated with maternity, and suicides.

The fatal accident record, however, is in marked contrast to these encouraging facts for the important diseases. The April rate for accidents as a group was 57.3 per 100,000, which may be compared with 52.8 for April, 1924. Automobile fatalities, as in March, recorded an increase this year.

The general deathrate for the large cities of the United States during April was 14.4 per 1,000 estimated population, or the same as for April of last year. There was a decline as compared with March, 1925. Health conditions, in general, were good. Comparison with April, 1924, shows less sickness from diphtheria, measles, scarlet fever and smallpox, although there were increases in influenza, malaria, poliomyelitis, typhoid fever and whooping cough cases. As compared with March, 1925, there was less diphtheria, influenza, poliomyelitis, scarlet fever, smallpox and typhoid fever, but increased prevalence of malaria, measles and whooping cough.

There was, in general, less diphtheria than in March. Scarlet fever cases declined perceptibly. One epidemic broke out at Goshen, Indiana, necessitating the closing of schools, churches and other public buildings for a brief period. The increase in measles cases was quite general, notably in Connecticut, where 619 cases were reported in the first three weeks of April as compared with 409 during the corresponding weeks of March; in Illinois there were 3,644 cases reported during these same weeks as compared with 2,985 during the same period in March.

Although there was less smallpox than during the prior month, conditions were more or less serious in several localities. Accounts

in the press of the country, nevertheless, have exaggerated somewhat the smallpox situation in Washington, D. C., the number of cases actually observed being by no means as large as reported. The actual number of cases in that city between January 1, 1925 and May 4 was 53. The type of the disease, however, was virulent, as there were 19 deaths. A large number of Government employees were vaccinated. Cases continued to be reported in Milwaukee and the Health Commissioner predicted that this would continue for six months unless the people gave a better response to appeals to be vaccinated. In Philadelphia, smallpox conditions were reported on April 30 to be much improved and it was estimated that a total of 100,000 vaccinations would be reached in that city by May 2. Supplies of vaccine were sent to Alliance, Ohio, from other cities, to be used in connection with the outbreak there.

Influenza prevalence dropped markedly in April.

Among the principal health activities of April the following deserve special mention: A mental hygiene clinic under the direction of the Maryland State Board of Mental Hygiene was opened at Hagerstown, April 9. The Bureau of Mental Health, Pennsylvania Department of Welfare, announced the establishment of two additional clinics. St. Paul celebrated its fourth annual Child Health Day on April 25.

The following table displays the mortality among the Industrial policyholders for April, 1925, March, 1925, April, 1924 and for the year 1924.

METROPOLITAN LIFE INSURANCE COMPANY.

Deathrates* per 100,000 for Principal Causes, Premium-paying Business in Industrial Department. (Annual Basis.)

MONTHS OF MARCH, 1925, APRIL, 1925, AND OF APRIL, 1924.

CAUSES OF DEATH	RATE PER 100,000 LIVES EXPOSED*			
	Apr., 1925	Mar., 1925	Apr., 1924	Year 1924†
TOTAL—ALL CAUSES	1014.9	1025.6	1076.5	907.5
Typhoid fever	2.0	2.4	2.8	4.4
Measles	4.5	3.4	14.8	7.2
Scarlet fever	4.8	6.1	6.7	4.4
Whooping cough	8.8	6.9	11.6	7.4
Diphtheria	12.8	11.5	12.6	13.2
Influenza	44.5	47.7	29.1	16.0
Tuberculosis (all forms)	105.4	113.4	120.5	104.5
Tuberculosis of resp'y system	92.3	99.3	106.1	92.6
Cancer	70.0	69.9	73.1	70.4
Diabetes mellitus	16.1	17.9	16.9	14.9
Cerebral hemorrhage	56.6	58.3	60.5	60.2
Organic diseases of heart	138.5	146.1	147.5	123.7
Pneumonia (all forms)	134.0	140.4	148.5	88.8
Other respiratory diseases	16.8	18.7	19.2	13.9
Diarrhea and enteritis	17.5	16.9	20.8	32.2
Bright's disease (chronic nephritis)	76.1	76.8	75.8	65.5
Puerperal state	18.9	19.2	19.8	16.8
Suicides	7.2	7.7	8.1	7.2
Homicides	7.7	6.5	7.5	7.1
Other external causes (excluding suicides and homicides)	57.3	52.5	52.8	62.7
Traumatism by automobile	13.6	14.0	13.0	15.7
All other causes	215.2	203.3	227.9	187.0

*All figures include infants insured under one year of age.
†Based on provisional estimate of lives exposed to risk in 1924.

Correspondence on the subjects discussed in these BULLETINS may be addressed to: The Editor,

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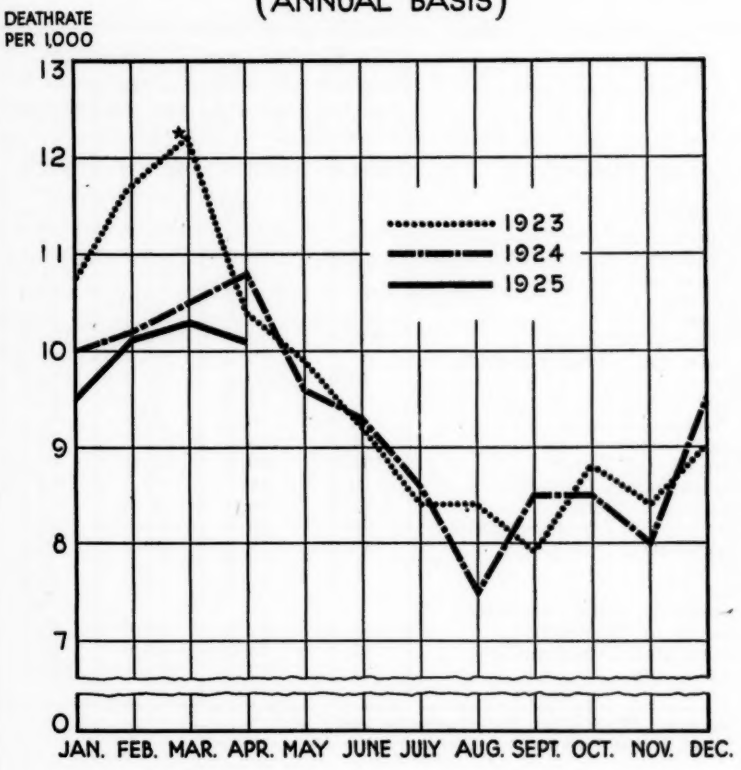
DEATHRATE PER 1000 *in* SPECIFIED MONTHS *of* 1923, 1924, 1925

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT
(ANNUAL BASIS)



	1923	1924	1925		1923	1924	1925
JAN.	10.7	10.0	9.5	JULY	8.4	8.6	
FEB.	11.7	10.2	10.1	AUG.	8.4	7.5	
MAR.	12.2	10.5	10.3	SEPT.	7.9	8.5	
APR.	10.4	10.8	10.1	OCT.	8.8	8.5	
MAY	9.9	9.6		NOV	8.4	8.0	
JUNE	9.2	9.3		DEC	9.0	9.5	

★ *Beginning with March, 1923, figures include mortality of infants under one year of age.*

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